

I. AMENDMENTS TO THE CLAIMS

This listing of claims will replace all prior versions, and listings of claims in the application:

Listing of Claims:

- 1 13. (Original) A semiconductor processing apparatus comprising:
 - 2 a current source;
 - 3 a microprobe coupled to the current source, the microprobe configured to apply a scan
 - 4 current to a semiconductor device on a wafer under a predetermined ambient
 - 5 temperature, the microprobe also configured to capture data concerning performance
 - 6 characteristics of the semiconductor device during the application of the scan current
 - 7 thereto, wherein the scan current is higher than the normal operating current of the
 - 8 semiconductor devices and the predetermined ambient temperature is higher than the
 - 9 normal operating temperature of the semiconductor devices; and
 - 10 a processing module coupled to the microprobe, the processing module configured to
 - 11 receive the data captured by the microprobe and to determine whether the
 - 12 semiconductor device is prone to infant mortality based on the data.
- 1 14. (Original) The apparatus as recited in Claim 13, wherein the semiconductor device is a
- 2 vertical cavity surface emitting laser (VCSEL) device.
- 1 15. (Original) The apparatus as recited in Claim 13, wherein the microprobe is further
- 2 configured to repeatedly apply the scan current to the semiconductor device and
- 3 capture the data concerning performance characteristics of the semiconductor device
- 4 during each application of the scan current for a predetermined number of times, and
- 5 wherein the processing module is configured to determine whether the

6 semiconductor device is prone to infant mortality based on a comparison of the data
7 received for said repeated applications of the scan current.

1 16. (Original) The apparatus as recited in Claim 13, which is configured to process a
2 plurality of said semiconductor device on the wafer.

1 17. (Original) The apparatus as recited in Claim 16, which is further configured to process
2 said plurality of said semiconductor device one at a time in serial fashion.

1 18. (Original) The apparatus as recited in Claim 16, which is further configured to process a
2 subset of said plurality of said semiconductor device simultaneously, wherein said
3 subset includes more than one but not all of said plurality of said semiconductor
4 device on the wafer.

1 19. (Original) The apparatus as recited in Claim 13, wherein the microprobe is further
2 configured to apply the scan current to the semiconductor device for as long as 20
3 milliseconds (ms).

1 20. (Original) The apparatus as recited in Claim 13, wherein the microprobe is further
2 configured to apply the scan current of substantially higher than 20 milliamperes
3 (mA) to the semiconductor device.

1 21. (Original) The apparatus as recited in Claim 13, wherein the microprobe is further
2 configured to apply the scan current of as high as 50 milliamperes (mA) to the
3 semiconductor device.

1 22. (Original) The apparatus as recited in Claim 13, wherein the microprobe is further
2 configured to apply the scan current to the semiconductor device using a current
3 sweeping mode.

1 23. (Original) The apparatus as recited in Claim 13, wherein the microprobe is further
2 configured to apply the scan current to the semiconductor device using a current
3 pulsing mode.

1 24. (Original) A system for burning-in semiconductor devices, comprising:
2 a processor; and
3 a mechanical module coupled to and controlled by the processor, wherein the
4 mechanical module is configured to (1) apply a scan current to the semiconductor
5 devices on a wafer; (2) capture data concerning performance characteristics of the
6 semiconductor devices during the application of the scan current thereto, wherein the
7 scan current is higher than the normal operating current of the semiconductor
8 devices; and wherein the processor is configured to receive the data captured by the
9 mechanical module for determining whether the semiconductor device is prone to
10 infant mortality.

1 25. (Original) The system as recited in Claim 24, which is configured to process vertical
2 cavity surface emitting laser (VCSEL) devices.

1 26. (Original) The system as recited in Claim 24, wherein the mechanical module is further
2 configured to repeatedly apply the scan current to the semiconductor devices and
3 capture the data concerning performance characteristics of the semiconductor
4 devices during each application of the scan current for a predetermined number of
5 times, and wherein the processor is further configured to determine whether the
6 semiconductor device is prone to infant mortality based on a comparison of the data
7 received for said repeated applications of the scan current.

1 27. (Original) The system as recited in Claim 24, which is configured to process the
2 semiconductor devices one at a time in serial fashion.

1 28. (Original) The system as recited in Claim 24, which is configured to process a subset of
2 the semiconductor devices simultaneously, wherein said subset includes more than
3 one but not all of the semiconductor devices on the wafer.

1 29. (Original) The system as recited in Claim 24, wherein the mechanical module is further
2 configured to apply the scan current to the semiconductor devices for as long as 20
3 milliseconds (ms).

1 30. (Original) The system as recited in Claim 24, wherein the mechanical module is further
2 configured to apply the scan current of as high as 50 milliamperes (mA) to the
3 semiconductor devices.

1 31. (Original) The system as recited in Claim 24, wherein the mechanical module is further
2 configured to apply the scan current to the semiconductor devices in a current
3 sweeping mode.

1 32. (Original) The system as recited in Claim 24, wherein the mechanical module is further
2 configured to apply the scan current to the semiconductor devices in a current
3 pulsing mode.

1 43. (New) In a process for manufacturing a semiconductor device that has performance
2 characteristics that may vary during the initial period of operation, a method for
3 stabilizing the device comprising:
4 a. applying a test current to the semiconductor device for a brief period of time; and
5 b. repeating step (a) above at an incremental current over the test current until the test
6 current is above the normal operating current of the semiconductor device.

1 44. (New) The method of claim 43, further comprising providing an elevated ambient
2 temperature for the semiconductor device during the steps of providing a sequence of
3 test currents.

1 45. (New) The method of claim 44, wherein the dwell time of each application of a test
2 current is about 15 ms.

1 46. (New) The method of claim 43, wherein the number of cycles of providing a test
2 current is about four.

1 47. (New) The method of claim 43, wherein the semiconductor device is a vertical
2 cavity surface emitting laser and the step of providing a test current to said semiconductor
3 device further includes sequentially providing a sequence of test currents, to each of the
4 vertical cavity surface emitting lasers on a wafer under test.

1 48. (New) The method of claim 43, wherein the scan current ramp rate, the number of
2 scans per device, the dwell time, the peak value of input current, and the ambient
3 temperature are adjusted for each process.